

# The Struggle for the Future of the Robotic Car in California

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## **The Struggle for the Future of the Robotic Car in California**

Until 2008, robotic cars were experimental, and limited to government, industry, and collegiate competitions such as DARPA's Urban Challenge, in which university teams designed and entered vehicles (Badue et al., 2020). Because robotic cars did not operate on public roads, policymakers and advocacies were uninvolved. Around 2008, commercial robotic cars were released, changing the public policy landscape. While Xu et al. (2019) conclude that some robotic road vehicles are far less likely to crash than conventional road vehicles, such findings are controversial. Rainie et al. (2022), for example, show public mistrust in the vehicles for a variety of reasons. Topolsek et al. (2020) found that "potential anxiety about using such advanced technology... has a large impact on purchasing intentions."

Since 2008, social groups in California have competed to determine the place of robotic vehicles in the future of road transportation in the state.

The National Federation of the Blind and several other advocacies for people with disabilities generally favor them. To these groups, robotic cars can grant unprecedented mobility to people whose disabilities preclude driving. Policymakers have been influenced by pressure from such groups, as well as from automakers and tech companies. In California, opponents of robotic cars include Safe Street Rebels, which contends that robotic cars are unsafe and that the companies that operate them are unaccountable. In itself, this group is insignificant, but it represents a much broader array of Californians who regard robotic cars as a failed passenger mobility mode that persists only to serve the business interests of their manufacturers and operators.

Robotic car companies, advocacies for people with disabilities, and some governmental figures have pushed robotic cars and robotaxis experimentally in California since 2008, while

other governmental figures and advocacies like Safe Street Rebels have pushed back against robotic car's wide range use largely due to safety concerns in unproven technology.

## **Review of Research**

Kareem Othman reviews various implications of robotic vehicles including the implications of vehicle ownership, where a collection of studies showed “significant increase in vehicle utilization from 5% in conventional vehicles up to 75%” (Othman 2022). Othman also contended that “Simulations of AVs [autonomous vehicles] as a shared mode showed that every AV can replace more than 10 conventional vehicles,” but also recognized that “using AVs privately showed a slight reduction in the overall vehicle ownership ... showed that every AV can replace 2.5 conventional vehicles”. Othman makes other positive claims like “AVs have the potential to increase coverage and accessibility for aged, disabled individuals, and people with limited transportation such as people in rural areas,” and “AVs allow passengers to be engaged in other activities, which means that the trip time will not be considered as an economic loss.” If these claims come to bear, they could benefit society, but they make understanding the ongoing debate surrounding robotic cars all the more important and interesting.

Despite the potential for increased vehicle utilization, a study by Rainie et al. with the Pew Research Center suggests that “Roughly six-in-ten adults (63%) say they would *not* want to ride in a driverless passenger vehicle if they had the opportunity, while a much smaller share (37%) say they would want to do this,” but also recognizes an age gap saying “Adults under the age of 50 are about twice as likely as those 50 and older to say they would ride in this type of car (47% vs. 25%)” (Rainie et al., 2022). This creates a hurdle to overcome, not just in the eyes of regulators and advocacies, but with the people using the product before they could ever see widespread use, and public opinion plays a huge role in understanding robotic cars' use.

Similarly, another study says that “More than half of the older adults (58.9%,  $n = 73$ ) said they were not willing to use [Fully Autonomous Vehicle] ride sharing” (Siegfried et al., 2021). Also, “Nearly half of the respondents who were not willing to ride in a self-driving car said it was due to concerns about safety and technology” (Siegfried et al., 2021). Siegfried et al. (2021) go on to suggested that “there were four themes related to the desired features of self-driving cars that would make older adults willing to use FAV ride sharing: (1) a proven safety record; (2) dependability and accuracy; (3) ability to interface with the vehicle; and (4) ability to override the automated system.” This research provides an interesting look at the efficacy of robotic cars, since no matter what advocacies, trade groups, or the government do, the general public’s trust in robotic cars will determine if they are used.

### **Safety Concerns Regarding Robotic Cars**

The safety of robotic cars and the accountability of their operators are controversial. The Safe Street Rebels argue that “robotaxis are effectively above the law. Their fleets cannot be cited for traffic violations” (Babe, 2023). This brings up concerns about a lack of repercussions and accountability that robotaxi companies are held to. They take a very active stance against these robotaxis, as NPR reported the advocacy was “responsible for this so-called coning incident and dozens of others over the past few months,” with aims of disrupting the system through the use of cones placed on hoods to disable robotic cars, and other protests and acts of disruption to bring attention to their cause (Kerr, 2023). The Safe Street Rebels also contend that “robotaxi companies have made big promises about accessibility, but their actions show their true values. Their cars are not wheelchair accessible and do not pull up to the curb,” and that “Robotaxis add more [vehicle miles traveled] to San Francisco during a climate and traffic violence crisis. If we allow AVs to become as pervasive as their proponents want them to be, our

cities will only be forced further into car dependency because more people will just want to use a car more often since they don't have to control the car themselves” (Babe, 2023). Similarly, the Network for Safety in Our Streets & for Working People called on the governor “to remove all Waymo autonomous vehicles from city streets and revoke permits for other self-driving car companies like Cruise” after “a Waymo robotaxi was set on fire during Lunar New Year celebrations and a serious accident in October where a Cruise vehicle struck and dragged a San Francisco pedestrian” (Kelly, 2024). Even if pro-robotic car advocacies and governmental figures succeed and robotic cars are available for everyday use everywhere, the end consumer for the product still has to feel comfortable enough riding in them in order to use them. Countless products fail because consumers don't find the product useful, like it, or trust it. However, with robotic cars, pedestrians and other drivers could be put in danger from them even if they don't like it or trust it.

Several groups who are indirectly working on robotic cars also acknowledge the associated risks. The National Society of Professional Engineers says “The rapid advancement of autonomous vehicle technologies, with the eventual goal to develop driverless or entirely autonomous vehicles presents an exciting phase of the technological advancements of humans. This rapid advancement, however, presents the risks associated with development of an advanced technology to be deployed within an aging infrastructure and also on roads occupied by vehicles without this advanced technology” (NSPE, 2023). The American Planning Association takes a less direct way of acknowledging risk, putting the responsibility on lawmakers in their key principle “Policy makers must work to ensure appropriate regulatory and financial structures are in place to adequately support the effective deployment ... of this technology and related infrastructure decisions” (APA, n.d.).

## **Serving Underserved Communities With Robotic Cars**

Advocacies like the National Federation for the Blind (NFB) and others that serve disabled groups of people have pushed heavily for the use of robotic cars as a way for the people they represent to get places in an independent manner. The NFB aims to “educate and advocate on the need for federal autonomous vehicle legislation and regulatory exemptions so that achievements in transportation independence can exist ... in ordinary life” (NFB, n.d). They are one of the major private proponents of robotic cars, they don’t see it just as a way of making things easier and safer for people who already drive, but to enable those who can’t drive themselves to have more autonomy in their day to day lives. The American Association of People with Disabilities (AAPD) also supports the use of robotic vehicles, saying that they “provide support for companies designing accessible vehicles. Receiving input from multiple groups on how to address access concerns — for example, HMI needs to work for blind, deaf, and people with cognitive disabilities – provides valuable information to auto designers that will ensure success” (AAPD, 2023). Finally, Dr. Owens with the Epilepsy Foundation says that “I believe AVs would definitely change the way people living with epilepsy would be able to integrate with other aspects of society” and that “Opportunities for employment, ability to decrease social isolation, ability to interact with others, or even go to healthcare appointments would open up” (Kaider, 2019). This shows a unique side that is advocating for the rollout of robotic cars without an economic interest in them, like many other pro-robotic car groups have.

Robotic cars as a use case for those with disabilities has a very large base of people that it could serve and benefit. This includes upwards of 1 million blind Americans and 6 million Americans with vision loss (CDC, 2022). This group expands up to “an estimated 25.5 million Americans have disabilities that make traveling outside the home difficult,” with “an estimated

13.4 million of these Americans—more than half—are adults age 18 to 64, the age group with typically high labor force participation” (BTS, 2024). Although robotic cars would not make all of those people’s lives easier, the advocacies standing for them have strong cases that robotic cars could help a lot of Americans with disabilities.

### **Robotic Cars in an Aging America**

Advocacies for the aging population of America suggest that robotic cars can serve as a great solution for the limited mobility of older generations. Although they may have a lower rate of wanting to use the cars as discussed in Rainie et al. (2022), the National Council on Aging suggests that “Three-quarters of respondents said they expect to use SDHR technologies in the future, and 71% agreed it would help them maintain their independence” (Trull, 2021).

Although, this is contradicted by another recent study of people 65+ which showed a “pre-existing distrust in vehicle movement on roads coupled with the innate distrust in new and unproven technology explains the nonpositive rating of trust by older pedestrians” (Rahman et al., 2019). This rift in studies may be contradictory to each other, or may suggest that older generations are not ready for robotic cars in their current state but are open to them in the future due to the potential for increased mobility and independence. The claim by the National Council on Aging is shared by companies that provide living assistance, for example “Michael DiAsio, owner of Visiting Angels Las Vegas, DiAsio said that he expected self-driving cars would reshape the senior care landscape” (Visiting Angels, 2022). These opinions could influence lawmakers when considering laws around robotic cars given the historically higher voting power associated with older generations. This makes these opinions highly important when considering how older generations are impacting the younger generations, who will have to live with

whatever policies surrounding robotic cars get created, even if the older generations won't have to live with the consequences.

This divide in current willingness to use robotic cars and the perceived future usefulness has a couple of explanations. One study says “the results also revealed that if the older adults are familiar with self-driving vehicles, they are more likely to have a favorable perception of them. This emphasizes the need for an effort to educate older adults about the benefits of self-driving vehicles as well as about how to interact with them” (Rahman et al., 2019). The National Council on Aging claims that, even without guarantees towards the safety being absolutely proven, 75% of older adults “expected to use [self-driving and ride hailing services] in the future, with 70% planning on using it” (Trull, 2021). Although that advocacy may be pushing their agenda with that claim, their data may support the point that older generations see this technology as useful in the future despite current issues with it.

The AARP, an advocacy for retired persons, sees robotic cars as useful, but not as much as advocacies do. They contend that robotic cars “primarily cater to the *easiest-to-serve* older adult, as well as younger and other populations” while leaving “a large population of *harder-to-serve* older adults out of the new mobility revolution, largely unable to access its benefits” (AARP, 2023). They go further to say there are 3 challenges surrounding the use of robotic ride hailing services, including “Using these emerging transportation technologies requires smartphone and internet access,” “The vehicles can be difficult to enter and exit, and they may not easily accommodate the walking aids or wheelchairs that are used by approximately a quarter of all older adults,” and “Current ride hailing and projected AV services focus almost exclusively on curb-to-curb service, but many older adults need door-to-door or hand-to-hand service due to challenges” (AARP, 2023). These are all valid points, and are issues



that cannot be addressed by the use of more technology, meaning industry giants may have to find new solutions to serve that community. Some advancements towards addressing these concerns have been made, reportedly “Cruise ... revealed a wheelchair-accessible robotaxi that it says could start picking up disabled passengers as soon as next year,” but the claim by some news agencies that the “newly accessible robotaxi is a major step toward fulfilling the dream of people with vision, hearing, and mobility impairments,” is highly flawed when applied to disabilities beyond wheelchairs (Hawkins, 2023).

### **Governmental Positions on Robotic Cars**

Despite advocacies taking strong positions one way or the other, governmental figures and lawmakers have the final power to make permanent change are, and they currently appear to support robotic cars. The current California governor, who appears to support robotic vehicles, vetoed a bill on September 23, 2023 that would ban driverless robotic trucks on California roads (Marshall, 2023). This shows an unwillingness to limit robotic cars in California, meaning that unless social groups against robotic cars can elect an anti-robotic car governor, they may see limited progress on a state law level. However, Governor Newsom also has some questionable beliefs surrounding robotic cars, saying “with AI in particular aiding this advancement, I think it’s just going to explode and you’re going to start seeing driverless flying cars as well” which there is some development on, but the governor seems to be buying fully into any technology that he can (Rosenhall, 2023). In addition, the California Public Commission also appears to support robotic vehicles. On August 10, 2023, “the commission ruled to allow the companies to operate across the city 24/7 and charge passengers for the ride” (Kupfer & Mojaddad, 2023). Instead of only being able to charge for rides at night, they are now able to run throughout the day, making their business more profitable. In the same Kupfer & Mojaddad article, they mention

“city leaders, first responders and labor unions had all called on the California Public Utilities Commission to slow the robotaxis' rollout, citing safety issues,” with concerns about robotic cars not always yielding to first responders.

### **Trade Group Influencing Rollouts and Unions Responses**

Trade associations routinely push government bodies to allow more allowances for robotic vehicles through press releases and testimonies. Google, Ford, and Uber also created a lobbying group for similar purposes, where the former head of the National Highway Traffic Safety Administration is a spokesperson, and claims “Self-driving vehicle technology will make America's roadways safer and less congested ... The best path for this innovation is to have one clear set of federal standards, and the Coalition will work with policymakers to find the right solutions that will facilitate the deployment of self-driving vehicles” (Hawkins, 2016). This group rebranded later on into the Autonomous Vehicle Industry Association (AVIA), who represents several trade groups, and routinely write letters to governors and officials arguing in favor of robotic cars, including one to Secretary of Transportation Pete Buttigiege in which they claim “AVs will reduce traffic crashes and fatalities because they eliminate human errors like fatigued, impaired, and distracted driving. The need to dramatically improve road safety has never been higher, and we need to take an “all-of-the-above” strategy that includes AVs alongside other safety measures,” (AVIA, 2023c) and another letter to Governor Newsom in which they say “thanks to your Administration’s work to develop frameworks for autonomous vehicle (AV) testing and deployment in the state, AVs stand to significantly improve safety on California roads” (AVIA, 2023a). This last statement is especially interesting, since the experimental nature of Californian laws would likely only serve as a downside in the form of deaths and issues in the testing phase of robotic cars, while the potential benefits from the final

technology would benefit more or all states. This trade group also went before a transportation subcommittee claiming that “Autonomous trucking is one the technology’s most promising applications and will deliver safer roads, as well as supply chain, global competitiveness, and workforce benefits” (AVIA, 2023b).

In essentially direct opposition to these trade groups, transport labor unions have worked through similar means to protect their workers despite AVIA’s 2023 claim of “workforce benefits.” This includes a statement that says “Transport Workers Union of America (TWU) and nearly 2 dozen other unions are calling on the federal government to crack down on dangerous RoboTaxis and the companies that are testing these driverless vehicles on city streets, often without oversight or regulation” (TWU, 2023). Additionally, “unions also want NHTSA to subject driverless vehicles to stricter federal regulations and oversight—action that the Transport Workers Union of American (TWU) has long called for” (TWU, 2023). Their president John Samuelson also said “Driverless vehicles are a menace to society. These untested, unproven robots block traffic, hinder first responders and emergency services, and harm pedestrians and other road users—with tragic consequences” (TWU, 2023). This critical evaluation of robotic vehicles sets this group as the direct opponent of trade groups in the rollout of robotic vehicles in California.

## **Conclusion**

Overall, the rollout of robotic vehicles in California has been met with a variety of responses. Trade groups suggesting that using California as a proving ground for robotic cars would help California seemingly more than other states in the long run is a dangerous mantra, since the development of this technology has seen danger and backlash. Furthermore, small advancements towards accessibility do not aim to fix the overarching problems associated with

making technology easier to use for older generations and the problems will likely not be fixed by the use of even more technology. This is further exacerbated by the issue of some people in older generations, who some claim this technology would give more independence to, needing “door-to-door or hand-to-hand service due to challenges” (AARP, 2023). Trade groups and those who don’t understand the full picture when it comes to using robotic vehicles to increase independence provide largely straw man arguments to further their agenda in California, the biggest of which is suggesting that holding development in California somehow stands to “significantly improve safety on California roads” more than it would if developed in another state and brought to California when safety tested and approved (AVIA, 2023a). The governor and the California government appear to be approving the development of robotic cars in California despite major opposition to it from several large groups, which may become a point of contention for the next gubernatorial election.

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